UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,534	06/20/2000	Michael J. Piatt	SPP258KPA	5984

7590 04/13/2004

Barbara Joan Haushalter
228 Bent Pines Court
Bellefontaine, OH 43311

EXAMINER	
STEPHANY, TIMOTHY J	

ART UNIT	PAPER NUMBER
2622	5

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/597,534	Applicant(s) PIATT ET AL.	
	Examiner Timothy J. Stephany	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *June 20, 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

On page 5, line 16: typographical error, the phrase "assigning all for colors" should read "assigning all four colors".

On page 5, line 18: typographical error, the reference character **8** should be **9**, in references to the images in Figure 1.

On page 5, line 21 or anywhere else it appears in the specification: unclear rendering, the phrase, "upper ink limit" should read "total ink limit" or "total upper ink limit", when it is meant to express the total ink limit.

Appropriate correction is required.

Drawings

Figure 1 is objected to as failing to comply with 37 CFR 1.84(p)(5) because it includes the following reference sign(s) not mentioned in the description: **1, 2, 9-14** and **17**. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Figure 4 is objected to as failing to comply with 37 CFR 1.84(p)(5) because it does not include reference sign(s), nor are any reference signs mentioned in the

description. A proposed drawing correction, corrected drawings, and amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The term "limiting condition" in **claim 1** is a relative term, which renders the claim indefinite. The term "limiting condition" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term "subjective" in **claims 9-12** is a relative term, which renders the claim indefinite. The term "subjective" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term "preferred" in **claims 7, 11 and 12** is a relative term, which renders the claim indefinite. The term "preferred" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

The term "non-preferred" in **claims 12** is a relative term, which renders the claim indefinite. The term "non-preferred" is not defined by the claim, the specification does

not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claims 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The "total upper ink limit" (taken to be equivalent to the "total ink limit" of the specification) comprising the "first upper ink limit" and the "second upper ink limit" (as defined in claim 7) does not lend a clear meaning as to how the total upper ink limit is meant to be defined in relation to the first and second upper ink limits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318). Huang discloses a device and method of determining an amount of ink to be used to print a color (abstract), among multiple inks (col. 1, lines 15-20), with a given printer and substrate (col. 2, lines 48-50) such that a test pattern is printed consisting of a plurality of wedges (test patches) with said printer and substrate (with said printer and substrate (col. 3, lines 12-15 and step **S60** in Figure

3) and that there exists a limiting condition for the printer and substrate, being the use of a selected values for each ink point (**S50** in Figure 3) in the determination of maximum ink boundary (upper ink limit) (**S90** in Figure 3), and that this is used to calibrate the ink (**S130** in Figure 3).

Huang fails to disclose the generation of a tone curve for use in determining the upper ink limit and in using the tone curve in the calibration.

McCauley adds that in a calibration method and system for a printer (abstract) that the measured device response curve (tone scale curve) (**26** in Figure 2) and can be used to produce a correction function (**20** in Figure 2) in order to produce a new aim curve (**24** in Figure 2).

Huang and McCauley constitute analogous art due to their similarity of structure and function in the same field of endeavor, being color calibration. Thus it would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit and using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, based upon the combined teachings of Huang and McCauley.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318), further in view of Huang ('692). Huang ('061) and McCauley disclose the method and device disclosed in the claim 1 rejection above.

But fail to teach explicitly that the plotting of the color test pattern is in CIELAB color space (referenced from the substrate color) and that the distance from the substrate to a given point in Euclidian space as a measure of color intensity.

Regarding **claim 2**, Huang ('061) adds that the patches are measured in CIELAB color space (col. 7, lines 56-58), which are then plotted and referenced to the substrate white (Figure 6). Also that there is defined a vector from the maximum point (upper ink limit) to the white point (col. 8, lines 17-19). Huang ('061) does not clearly teach that the white point is the substrate color.

Huang ('692) adds that reference for an L* curve can be made from the paper white point to the 100% saturated ink (col. 5, lines 47-49).

Regarding **claim 3**, Huang ('692) adds that the L* curve is a target curve, and that this is used as the aim curve and that this is linear from the paper white point to the 100% saturated (upper) ink limit (col. 5, lines 47-49). McCauley adds the generation of a one-dimensional transform (correction function, **20** in Figure 2) that can be used to force the data (device response, **26** in Figure 2) into line with the aim curve (**24** in Figure 2).

Regarding **claim 4**, the correction function in McCauley can be used as a transfer function to produce the linear relationship from the substrate color to the maximum ink limit in CIELAB color space, as shown in Huang ('692), based upon the same arguments contained in the rejection of claim 3 above.

Huang and McCauley and Huang constitute analogous art due to their similarity of structure and function in the same field of endeavor, being color calibration. Thus it

would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit and using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, to plot this in CIELAB space and determine a distance from the substrate color as a measure, wherein a calibration is done by fitting a curve to the CIELAB plot, with a linearly increasing ink level to an upper limit, and a corresponding LUT (look-up table or transform), with the LUT forming a linear relationship in CIELAB space between the substrate color and maximum level, based upon the combined teachings of Huang and McCauley and Huang.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318), further in view of Shin ('320). Huang ('061) and McCauley disclose the method and device disclosed in the claim 1 rejection above, but fail to teach that the test patches linearly increase over the entire dynamic range of the printing system and that they are scanned with a spectrophotometer for all points.

Shin adds that each calibration test sheet is generated by printing a large number of patches in a 10x10x10 matrix that are distributed throughout the printers color space (col. 5, lines 33-39) and that they are measured with a spectrophotometer (col. 5, lines 45-49).

Huang and McCauley and Shin constitute analogous art due to their similarity of structure and function in the same field of endeavor, being print processes including

color calibration or correction. Thus it would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit, using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, wherein the test patches linearly increase over an entire dynamic range of the printing system and said patches being measured by a spectrophotometer, based upon the combined teachings of Huang and McCauley and Shin.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318), further in view of Narendranath ('434). Huang ('061) and McCauley disclose the method and device disclosed in the claim 1 rejection above, but fail to teach determining a first upper limit for color text and a second upper ink limit for graphics.

Narendranath adds that a user may vary the TRC applied to various object types (text, graphic and pictorial) that appear on the document (col. 9, lines 1-5) whereby one reduced slope/maximum density TRC may be employed (col. 9, lines 6-7).

Huang and McCauley and Narendranath constitute analogous art due to their similarity of structure and function in the same field of endeavor, being print processes including color calibration or correction. Thus it would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality

of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit, using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, and determining a first upper limit for text and a second upper limit for graphics, based upon the combined teachings of Huang and McCauley and Narendranath.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318), further in view of Allen ('662). Huang ('061) and McCauley disclose the method and device disclosed in the claim 1 rejection above, but fail to teach the upper ink limit of ink used for graphics derived from a subjective determination of the total upper ink limit.

Allen teaches that the maximum ink volume (upper ink limit) is determined by a subjective user judgment (col. 3, lines 52-55) and that this can be done for graphic image data (col. 4, lines 64-65 and shown in Figure 1).

Huang and McCauley and Allen constitute analogous art due to their similarity of structure and function in the same field of endeavor, being print processes including color calibration or correction. Thus it would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit, using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, and performing an evaluation of the upper ink limit for each ink color in

graphics printing, based upon the combined teachings of Huang and McCauley and Allen.

Claim 13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang ('061) in view of McCauley ('318), further in view of Sahay ('840), in further view of Borrell ('340). Huang ('061) and McCauley disclose the method and device disclosed in the claim 1 and 14 rejections above, but fail to teach use of a test page with image and graphics data.

Sahay adds a test pattern print which includes a vector graphics portion and a bitmap portion (Figure 6). This test page can be for any purpose, including those that define the useful nature of the claims and the requirements involved.

Sahay does not teach that this is done for all colors. Borrell adds that the test page consists of patches for all colors (Figure 3).

Huang and McCauley and Sahay and Borrell constitute analogous art due to their similarity of structure and function in the same field of endeavor, being print diagnosis and processing calibration or correction. Thus it would have been obvious to those of ordinary skill in the art at or before the time of the invention by the applicant for a method using an identified printer and substrate for printing a test pattern with a plurality of patches with a plurality of inks, and generating a tone scale curve for evaluation of an upper ink limit, using this upper ink limit to generate a tone scale to calibrate any ink on any substrate, and having a test page with images and graphics or comprises a useful

pattern, based upon the combined teachings of Huang and McCauley and Sahay and Borrell.

Additional Notes

The examiner calls to the applicant's attention that the use of tone curves and LUT's are commonly applied in printer characterization and would have been obvious to do so by anyone skilled in the art.

Moreover, the examiner calls to the applicant's attention that the use of patches uniformly spaced through a printer's entire gamut and measuring them with a spectrophotometer are commonly applied in printer characterization and would have been obvious to do so by anyone skilled in the art.

Moreover, the examiner calls to the applicant's attention to the common use of a wide variety of test patterns typically used to evaluate and establish operation limits on printers across different media types.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zwaldo ('321), Beretta ('243) and Mestha ('308) refer to color correction; Watkins ('899) and Amero ('625) refer to ink bleed; Stokes ('209) refers to using an image and graphics test target; and Cooper ('597), Degani ('631), Nishida (US 2002/0080378 A1), Elsman (US 2003/0025925 A1), Milton (US 2003/0117639 A1), Xu (US 2002/0012038 A1), Shakespeare (US 2002/0039181), and Castelltort (US 2004/0021879) deal with media substrate influences.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Stephany whose telephone number is 703-305-8951. The examiner can normally be reached on 8:30 am - 4:30 pm ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on 703-305-4712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EDWARD COLES
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600